

## Ammonia

### Definition of causal agent

Ammonia is a colourless, suffocating, penetrating, acrid-smelling gas at ambient temperature and pressure and weighs less than air. It may easily be liquefied under pressure and it dissolves readily in water to form ammonium ions.

#### *Main occupational uses and sources of exposure:*

The major use of ammonia and its compounds is as fertilizers. Ammonia is also used for the synthesis of nitric acid and sodium carbonate; in the synthesis of numerous organic compounds used as dyes, drugs, in fibres and plastics, in explosives, in various metallurgical processes and in industrial facilities as a refrigerant for cooling and freezing. Ammonia solutions are used as cleansing agents. It is a product of coal distillation (coke ovens, gasworks) and released in the putrefaction of bio-organic materials.

### Toxic effects

#### *1. Acute effects*

##### **□ Irritant and corrosive effects:**

Ammonia may cause severe irritation of the skin, eyes and respiratory tract. Accidental exposures to concentrated aerosols of ammonium solutions or high concentrations of ammonia gas can result in nasopharyngeal and tracheal burns, airway obstruction, and bronchiolar and alveolar oedema. Recovery without pulmonary *sequelae* is usual but bronchial hyper responsiveness, chronic bronchitis, bronchiectasis, obliterative bronchiolitis and fibrosis have been reported after short-term exposure to high levels of ammonia.

Direct contact with liquid ammonia produces skin and ocular lesions of varying degrees of severity. It causes alkali burns, resulting in liquefaction of the tissue and deeper penetrations. Transient blindness, corneal abrasions, and sustained corneal damage are possible.

See section on *Occupationally caused irritation of the skin and mucous membranes* in Annex I entry nr. 202.

#### ***Exposure criteria:***

*Minimum intensity of exposure:* Occupational exposure confirmed, if possible assessed, by history and study of working conditions providing evidence of acute exposure to ammonia. And if available, workplace air monitoring:

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**Guide values:**

- Odour threshold: ~20 ppm
- Exposures to levels exceeding 50 ppm result in immediate irritation to the nose and throat; however, tolerance appears to develop with repeated exposure. Exposure to an air concentration of 250 ppm is bearable for most persons for 30–60 minutes. Exposure to 300 ppm is considered to be immediately dangerous to life and health.

*Minimum duration of exposure:* seconds to minutes.

*Maximum latent period:* the first manifestations should appear during exposure or within a few hours.